



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/431,157	11/01/1999	YEA-SUN YOON	6192.0114.AA	8343

7590 11/05/2002  
McGuireWoods LLP  
1750 Tysons Blvd  
Suite 1800  
McLean, VA 22102

EXAMINER

CHUNG, DAVID Y

ART UNIT PAPER NUMBER

2871

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/431,157

Applicant(s)

YOON ET AL.

Examiner

David Chung

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Art Unit: \*\*\*

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 24-26 rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yamagishi et al. (U.S. 5,790,219). Note in figure 4, the color filter 8, common electrode 9, black matrix 7, and pixel electrode 2. Note that the depth of the grooves is less than the thickness of the color filter. Note also that the black matrix has portions overlapping the grooves. The grooves in the color filter define the non-smooth portions in the common electrode.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: \*\*\*

Claims 6-10 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219) in further view of Lien et al. (U.S. 5,309,264) and Koma (U.S. 5,608,556). Note in figure 4 of Yamagishi, the color filter 8, common electrode 9, black matrix 7, and pixel electrode 2. Note that the depth of the grooves is less than the thickness of the color filter. Note also that both the pixel electrode and black matrix have portions overlapping the grooves. Yamagishi does not disclose pixel electrodes with apertures. Lien et al. discloses a liquid crystal display having multi-domain cells. See abstract and figure 2. Although Lien discloses a multi-domain cell with apertures in the common electrode, it was well known and obvious to those of ordinary skill in the art that apertures in the pixel electrode could also be used to create multi-domain displays as evidenced by the disclosure of Koma. See abstract and note aperture 33b formed in the pixel electrode as opposed to aperture 33a formed in the common electrode. Therefore, it would have been obvious to those of ordinary skill in the art at the time of invention to add apertures to the pixel electrodes in the display of Yamagishi et al. in order to create a multi-domain liquid crystal display.

Claims 11-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219) in further view of Lien et al. (U.S. 5,309,264) and Koma (U.S. 5,608,556). Lien et al. discloses the same aperture pattern as that claimed by the applicant. See figure 2.

'Art Unit: \*\*\*

Claims 15-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219) in further view of Lien et al. (U.S. 5,309,264) and Koma (U.S. 5,608,556). The multi-domain liquid crystal display of Lien et al. can be either homeotropic or twisted nematic. See abstract. With homeotropic liquid crystal displays, it was conventional to use liquid crystal material with negative dielectric anisotropy. It was also conventional to use liquid crystal molecules with chirality. Figure 2 of Lien et al. shows the polarizing axes 66 and 68 of the two polarizers to be perpendicular to each other. This feature was conventional for any type of display. Therefore, it would have been obvious to those of ordinary skill in the art at the time of invention to use perpendicularly aligned polarizers and liquid crystal molecules with chirality and negative dielectric anisotropy in a homeotropic multi-domain liquid crystal display because it was conventional.

Claims 19-23 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219) in further view of Lien et al. (U.S. 5,309,264) and Koma (U.S. 5,608,556). Figures 5, 6, 9, and 10 clearly show minute domains formed in the pixel area by the apertures where the average direction of the long axes of the liquid crystal molecules are directed in several directions, each minute region with a different direction. It was well known and obvious that the aperture pattern determined the number of minute regions and therefore the number of directions in which the liquid crystal molecules would be directed.

\* Art Unit: \*\*\*

Claim 27 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219). This method claim does not disclose anything that is patentably distinct from the device of claims 1-5 as the method steps are merely a recitation of structural elements. Therefore, this method would have been obvious to one of ordinary skill in the art at the time of invention.

Claim 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219). Forming the common electrode by two depositions of ITO was a conventional method of forming the common electrode. Therefore, this method would have been obvious to one of ordinary skill in the art at the time of invention.

Claims 29 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. 5,790,219). These methods for forming a color filter with grooves were conventional and functionally equivalent methods. Therefore, they would have been obvious to those of ordinary skill in the art at the time of invention.

### ***Response to Arguments***

Applicant's arguments filed June 17, 2002 have been fully considered but they are not persuasive. Those portions of Yamagishi et al. cited by the examiner can be reasonably interpreted as being grooves as claimed by applicant based on claim 4 and figure 8 of applicant's disclosure. Claim 4 recites the feature of grooves in the color filter based on the black matrix. These grooves would have to be formed at the

Art Unit: \*\*\*

boundary regions of the pixel area since the black matrix is also formed there. Furthermore, figure 8 is further evidence that the disclosure of Yamagishi et al. anticipates the grooves claimed by the applicant. Note that figure 4 of Yamagishi et al. shows similar color filter substrate elements as figure 8 of applicant's disclosure. Note the black matrix, color filter, and common electrode of both figures.

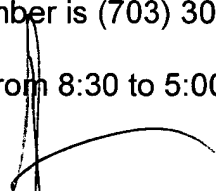
### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Chung whose telephone number is (703) 306-0155. The examiner can normally be reached on Monday-Friday from 8:30 to 5:00.

David Chung  
GAU 2871  
11/04/02



Kenneth Parker  
Primary Examiner  
GAU 2871